Congruent and Similarity Sorting Activity

Directions: Using the shapes located in your envelope, your group will be answering the following: What does it mean if a shape is congruent? Similar? How do you find the area and perimeter of a rectangle, square, and triangle?
- Assign the following jobs to your group members:
  - Recorder – student who records all data
  - Materials Handler – student who "handles" all materials for group
  - Speaker – student who verbalizes to the class and teacher
  - Time Keeper – student who keeps group on schedule

- Have the Materials Handler open the envelope. As a group, begin to separate the shapes into categories. Remember to look at the actual shape, the side lengths, and angle measurements.
- Have the Recorder begin to fill–out the note cards with the information you collect. Remember to put your names on every note card!
- Have the Speaker be prepared to present your data to the class with your observations.
- As a group, go through each category and select 2 shapes from each category that you think are similar to each other. Measure the side lengths and angles. Have the Recorder add this data to your note cards.
- As a group, find the perimeter and area of both similar figures for each category. Sketch the shape and write in your measurements on your note cards. Remember to show your work!
- As a group, record your observations of the similar figures.

Note Card Data

Category Name:

Reasons why these shapes belong together:

Similarities: Differences:

Side Lengths of Similar Shapes:

Angle Measurements of Similar Shapes:

Perimeter One: Perimeter Two:

Area One: Area Two:

Plus/Delta and Consensogram

Name: _____

Date: _____

Plus (+)	**Delta** ⟁**)**
What helped you learn today?	What should we change to help you learn better?

<u>Consensogram</u>

I could not explain the differences between Similarity and Congruence or Area and Perimeter.	I know the differences between Similarity and Congruence, and Area and Perimeter, but I don't feel comfortable explaining it.	I would like more practice in finding the differences between Similarity and Congruence, and Area and Perimeter.	I am an expert with Similarity, Congruence, Area, and Perimeter!

<u>Directions for using a Plus/Delta and a Consensogram:</u>

- A Plus/Delta Chart helps students examine the strengths and weaknesses in the process of learning used during a lesson. It provides an opportunity for students to improve and decide what their next step should be for the next lesson. Have students list strengths and opportunities for improvement.

- A Consensogram identifies the baseline knowledge or opinion of the students. On a selected concept. Have each student take a sticky dot and place it where he/she feels they fall when asked about a specific topic. Dots should be placed in a straight vertical line above the selected opinion. This is also a great way to compare classes. Designate a different color dot for each class. Remember, this is done anonymously, so students should feel more comfortable responding.

Area Exit Ticket

Name: _____

Date: _____

Answer the following questions. Include an example problem with each and the answer to your example.

1. Write a formula for the area of a square. Draw a square and find its area.

2. Write a formula for the area of a rectangle. Draw a rectangle and find its area.

3. Write the formula for the area of a triangle. Draw a triangle and find its area.

Table of Similar Figures

Rectangles

	Length (*l*)	Width (*w*)	Area (*lxw*)	Observation Notes (Compare area of original to area of similar figure)
Original	3	4		
	(×2)	(×2)		
Similar Scale factor (x2)	6	8		
				Hint: Look at the ratio (A$_{Original}$):(A$_{Similar}$)
Original				
	(×3)	(×3)		
Similar Scale factor (x3)				
				Hint: Look at the ratio (A$_{Original}$):(A$_{Similar}$)
Original				
	(×5)	(×5)		
Similar Scale factor (x5)				

In your own words…
Describe the relationship that you found between the area of the original figures and the similar figures and how that relationship compares to the scale factor for each set.

_____

_____

_____

_____

Table of Similar Figures

Name: _____
Date: _____

Triangles
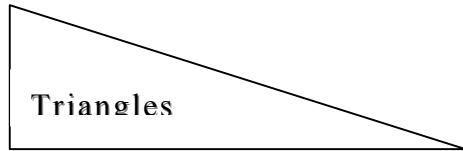
|	Base (b)	Height (h)	Area ($\frac{1}{2}bh$)	Observation Notes (Compare the area of the original figure to the area of the similar figure)
Original	6	3		
	(×2)	(×2)		
Similar Scale factor (x2)	12	6		
				Hint: Find ratio ($A_{original}$):($A_{similar}$)
Original				
	(×3)	(×3)		
Similar Scale factor (x3)				
				Hint: Find ratio ($A_{original}$):($A_{similar}$)
Original				
	(×5)	(×5)		
Similar Scale factor (x5)				

In your own words…
<u>Describe the relationship</u> that you found between the area of the original figures and the similar figures and <u>how that relationship compares</u> to the scale factor for each set.

_____

_____

_____

_____

Table of Similar Solids

Name: _____
Date: _____

Rectangular Prism
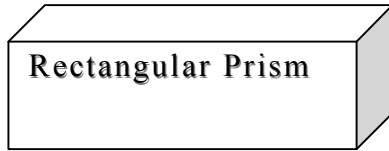
	Length (l)	Width (w)	Height (h)	Volume ($l \cdot w \cdot h$)	Observation (Compare area of original to area of similar figure)
Original					
	(×2)	(×2)	(×2)		
Similar Scale factor (x2)					
					Hint: Look at the ratio $(A_{Original}):(A_{Similar})$
Original					
	(×3)	(×3)	(×3)		
Similar Scale factor (x3)					
					Hint: Look at the ratio $(A_{Original}):(A_{Similar})$
Original					
	(×5)	(×5)	(×5)		
Similar Scale factor (x5)					

In your own words…
Describe the relationship that you found between the volume of the original figures and the similar figures and how that relationship compares to the scale factor for each set.

_____

_____

_____

_____
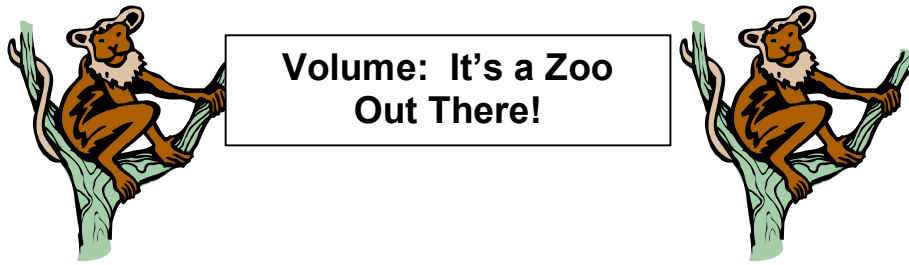
Volume: It's a Zoo Out There!

Purpose: Currently, the Wild Animal Zoo of Maryland has three adult monkeys living in the Baltimore Monkey House. From local donations, the zoo has the opportunity to add three more monkeys. However, the monkey house is not large enough for all six monkeys. The Wild Animal Zoo of Maryland has asked for assistance from local middle school math students. Your job is to design a new monkey house large enough to house all of the monkeys by applying practical uses for the concepts you have been learning about perimeter, area, and volume.

Time Line: You will have 2 class periods to complete your project working in pairs or individually. If you feel you will not be finished after the first day, your project may be worked on at home.

Materials: You may use the following materials:
- dot paper
- graph paper
- plain paper
- rulers
- calculators
- markers, crayons, or colored pencils
- computers (as assigned by your teacher)

Directions:
1. The dimensions of the current Baltimore Monkey House are 12 yards high, 15 yards wide, and 20 yards long. Using these dimensions, determine the perimeter, area and volume of the indoor monkey area

2. Each monkey requires 1,200 cubic yards of captive living space. Based on the amount of volume required for each monkey, determine how much larger you will have to make the new building to accommodate the three new monkeys. Using graph or dot paper, draw to scale your design for the new monkey house. Include all dimensions and labels. Color your design.

3. Complete the writing assignment explaining how and why you designed the new house for the zoo the way you did.

Volume: It's a Zoo Out There!

1. Find the volume, area, and perimeter of the current monkey house. Show all your work.

2. The volume of the new monkey house should be at least how much larger than the original in order to safely accommodate the new monkeys? (State your answer in cubic yards.)

3. Create the dimensions for your new building. Show all work to justify that your dimensions meet the requirements stated in directions

4. Calculate the total volume, area, and perimeter the new house will have with all six new monkeys. Use the space below to show your work. Be sure to check that the total volume is sufficient for *all* the monkeys.

5. Compare the volume, area, and perimeter of both the new and the old buildings.

In Your Own Words…

Explain how and why you designed the new house for the zoo the way you did. If you need more space, use the back of the page.

_____

_____

_____

_____

Volume: It's a Zoo Out There!

1. Find the volume, area, and perimeter of the current monkey house. Show all your work.

$$\text{Volume: } 12 \times 15 \times 30 = 3,600 \text{ Cubic Yards}$$
$$\text{Area: } 15 \times 20 = 300 \text{ Square Yards}$$
$$\text{Perimeter; } 2(20 + 15) = 70 \text{ yards}$$

2. The volume of the new monkey house should be at least how much larger than the original in order to safely accommodate the new monkeys? (State your answer in cubic yards.)

3,600 Cubic Yards

3. Create the dimensions for your new building. Show all work to justify that your dimensions meet the requirements stated in directions

Check Individual Student Work

4. Calculate the total volume, area, and perimeter the new house will need with all six new monkeys. Use the space below to show your work. Be sure to check that the total volume is sufficient for *all* the monkeys.

Answers will vary. Teacher should check to see that the volume is at least 3,600 Cubic Yards

5. Compare the volume, area, and perimeter of both the new and the old buildings.

Answers will vary. The volume should have at least doubled. Area and perimeter answers will vary.

In Your Own Words…

Explain how and why you designed the new house for the zoo the way you did. If you need more space, use the back of the page.